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WILLIAM TRELEASE,
Recording Secretary.

DISCUSSION AND CORRESPONDENCE.

*VON IHERING'S ARCHIPLATA-ARCHELEMIS
THEORY.*

IN SCIENCE for December 7th, Dr. H. von Ihering gives a condensed statement of his views on the origin of the South American fauna. This is the more welcome, since the original publications of v. Ihering, although dating back to 1890, are not very well known, chiefly because these articles (of which v. Ihering gives a list) have been published in periodicals, in which hardly anybody would look for them. Part of them are of a mere popular character, while another part are too much out of the way, and they do not, by their titles, give any indication that we might look in them for a discussion of zoogeographical topics of general interest.

As regards the chief idea of v. Ihering, that South America consists, genetically, of two different parts, *Archiplata* and *Archamazonas*, which have become united subsequently, I am of the opinion that this theory is well worth discussion. Indeed, I have accepted this theory in my studies of the distribution of the fresh-water Decapods, and have been able to collect further material in support of it. And further, in the report on the Tertiary Invertebrates of Patagonia, collected by the Princeton Expedition, which is in course of preparation, I shall again refer to this theory as a very acceptable one for the explanation of certain features in the distribution of marine animals. Therefore, I was much surprised to see that v. Ihering refers to my studies on the freshwater crabs and crayfishes as at variance with his theory, for only in this sense I can interpret his reference to my 'biogeographic' barrier.

My theory of a 'biogeographic barrier' formed by the *Potamonidae* (tropical fresh-water crabs) for the *Potamobiidae* and *Parastacidae* (crayfishes, restricted to the extratropical parts of either hemisphere) was formulated to explain only the *Bipolarity* of the latter groups, without any reference to the special conditions in South

America, but chiefly in respect to those prevailing in the old world.* I shall discuss this question again,† and shall pay particular attention to the South American conditions with reference to v. Ihering's theory: I think that the South American *Parastacidae* are members of the old Archiplatan fauna, and are connected genetically with the New Zealandian and Australian *Parastacidae*, and have reached these parts apparently by way of a land connection across the Antarctic regions, while the South American *Potamocarcininae* (subfamily of *Potamoniidae*) are characteristic of the old Archamazonian fauna, and point possibly to a former connection of the latter with Africa (v. Ihering's *Archhelenis*). In this connection I must add that v. Ihering's argument, given in the article referred to, as to the coexistence of *Potamocarcininae* and *Parastacidae* in southern Brazil is probably a mistake: there are to my knowledge no *Potamocarcininae* in southern Brazil, but the fresh-water crabs of small size, to which he probably alludes, are *Trichodactylinae*, the genetic relations of which are doubtful. They have nothing at all to do with my 'biogeographic barrier,' and certainly do not 'annul' it.

In favor of the theory of a former disconnection of the northern and southern parts of South America I may call attention to other considerations. A communication of the Atlantic and Pacific Oceans in Tertiary times is generally accepted, and this connection is chiefly placed at Panama. Now (according to Hill),‡ the Isthmus of Panama was land since Mesozoic times (with only an unimportant interruption at the end of the Eocene); but Hill himself admits that there must have been a connection of oceans somewhere in the Tertiary. The theory of v. Ihering gives us a clue to this. If we move the interoceanic connection from Panama southward, and construct it where there must have been the sea separating Archamazonas and Archiplata, that is to say, across

* See 'Bipolaritaet' in: Zool. Jahrb. Abt. f. Syst. v. 9. 1896, p. 593.

† 'Decapoden' in Brönn's 'Klassen und Ordnungen,' vol. 5 Abteil. 2, p. 1289. This part has not yet been issued, and I am quoting from proof sheets.

‡ Bull. Mus. Comp. Zool., v. 28, No. 5, 1898.

the South American continent about where there is now the Amazonas valley, we should still have a communication between both oceans within the tropics. Just this kind of connection is demanded by the facts that have led to the assumption of an interruption of the isthmus of Panama.

The former connection of v. Ihering's Archiplata with a supposed Antarctic continent is no new theory, but goes back, in this form, as far as Rütimeyer (1867), and I have no doubt that we should accept it.* But we hardly can accept it in the shape of Forbes' 'Antarctica' (1893). This huge continental mass is simply impossible, and Professor Osborn (SCIENCE, April 13, 1900) has very properly tried to restrict it to a reasonable size; but I think we should still more contract its boundaries. In this respect I should follow Hedley's† views, who practically, but without giving a map, accepts the limits of the present Antarctic continent (as defined by Enderby, Wilke's, Victoria and Graham Land), with only such extensions as are absolutely necessary to connect it with the present southern continents.

A. E. ORTMANN.

PRINCETON UNIVERSITY,
Dec. 7, 1900.

THE LONGEST AERIAL VOYAGE.

To THE EDITOR OF SCIENCE: The official report just received of the long-distance balloon race from Paris on October 9th, changes somewhat the figures on page 799 of SCIENCE, which were those furnished to the press. It appears now that Count de La Vaulx and a companion traveled 1,200 miles in 35 hours and 45 minutes in the basket of a balloon containing only 57,000 cubic feet of illuminating gas. They reached a maximum height of three and a half miles, crossed Germany and landed in Russia, as did another of the contestants. This is probably the longest continuous voyage in the air ever made, although it was nearly equaled forty years ago by our

* An historical account of the different theories advanced for the explanation of the relations of the southern faunas, and a classification of them, will shortly be published in the *American Naturalist*.

† Proc. Roy. Soc. N. S. Wales, 1895, August 7th.

countryman, John Wise, who, with two companions, went by balloon in 19 hours from St. Louis to Jefferson County, New York, a distance of 1,150 miles.

It is evident that, under the management of an aéronaut, a balloon can be kept longer in the air than an unmanned balloon, but, nevertheless, a balloon of 8,700 cubic feet capacity, carrying only self-recording instruments, which was liberated from Berlin in 1894, after attaining a height of ten miles was carried 700 miles to the borders of Bosnia, at a speed of 62 miles an hour. Still more remarkable, in its way, was the flight of a pair of kites last summer from the Royal Aéronautical Observatory near Berlin. Five kites, which had lifted self-recording meteorological instruments to a height of two and a half miles, broke the wire that confined them to the ground and the two upper kites dragged it across the country for nearly a hundred miles before they were finally checked, the trailing wire, two miles in length, furnishing sufficient resistance to keep the kites flying throughout the night.

A. LAWRENCE ROTCH.
BLUE HILL METEOROLOGICAL OBSERVATORY,
November 30, 1900.

'THE CRIMINAL, HIS PERSONNEL AND ENVIRONMENT.'

To THE EDITOR OF SCIENCE: Disclaiming in any sense to answer the attack upon my recently published book, 'The Criminal, his Personnel and Environment,' emanating from the pen of Mr. Havelock Ellis and published in your valued journal of the 19th inst., I nevertheless deem it but justice to myself to ask of my critic a verification of the assertion therein made, that: "When he (the author) mentions authorities he is unable in a large proportion of cases even to spell their names" (the italics and parentheses are my own). Now, as I happen to cite a very large number of names, and while fully conscious of my liability to err, the charge is an exceedingly broad, if not hazardous one, which, if failing to substantiate, will lay my critic open to a grave counter-charge. I respectfully challenge Mr. Ellis to make good his proofs, which, if true, may readily be done. In the event of his in-